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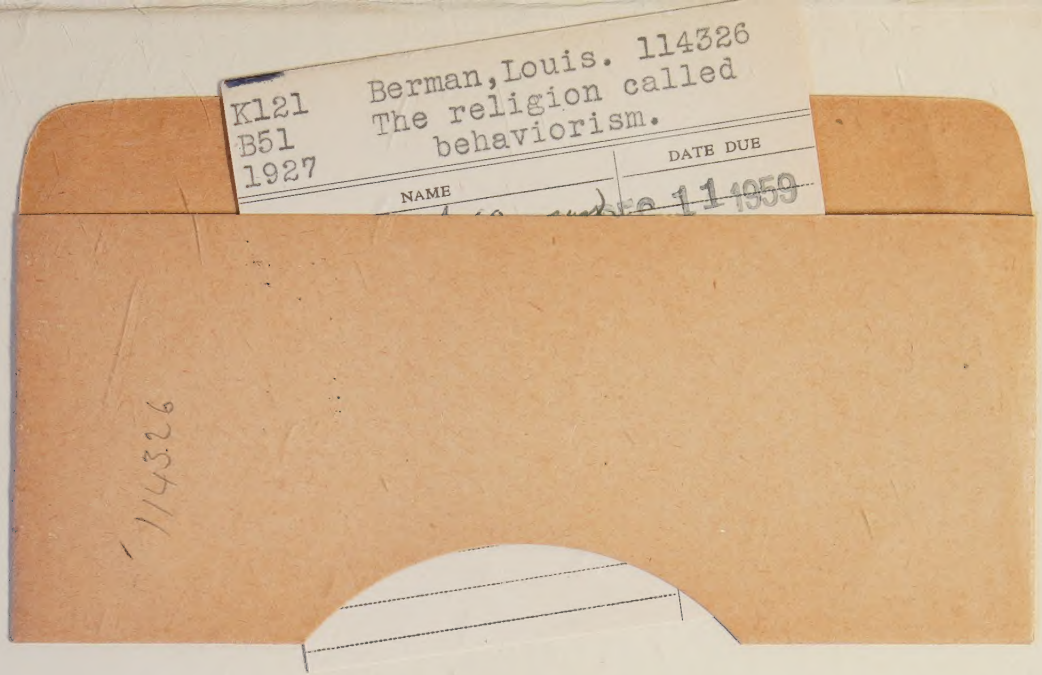
By

Dr. Louis Berman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THE RELIGION CALLED BEHAVIORISM

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THE RELIGION CALLED BEHAVIORISM

By

DR. LOUIS BERMAN

BONI & LIVERIGHT
NEW YORK 1927

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THE RELIGION CALLED BEHAVIORISM

THE RELIGION CALLED BEHAVIORISM

THE DOCTRINES OF WATSONIANITY

Urgently the world to-day needs a great new religion. Christianity is dead, Judaism is dead, Mohammedanism is dead, Buddhism is dead, for all spiritual purposes. To intelligent Jews and Christians there is no spell left in the obsolescent doctrines of their forefathers. Concomitantly, authentic reports are available from the East that the children of Mohammedans and Buddhists are turning against the faiths of their ancestors as strenuously as they are overturning their institutions. All over the planet there are at work the enzymes of change in fundamental beliefs and codes and attitudes, because of the effete decrepitude of ancient systems.

Slowly but steadily a new, a powerful religion is growing into maturity in the United States as a result of a new psychological movement. It calls itself Behaviorism. It might be called Watsonianity.

Behaviorism or Watsonianity was begotten by Darwinism out of the modern scientific spirit. The obstetrical attendant to the parturition was a man of genius and great personal force, John B. Watson. As a child of Darwinism, as indeed L'enfant Terrible of the Darwinian progeny, America may be expected to disgrace itself about it as soon as its implications reach the democratic mind. The uproar in the backward or moronic states of the Union concerning the teaching of evolution, which recently disgraced America, will turn out to be the foam of a passing ship as compared with the howls of consternation, denunciation and nervous prostration which will be emitted by the combined megaphones of press, pulpit and politician when the full significance of the New Faith finally filters down to their level. It will of course by that time have been distorted into the shape of a gargoylean monster by misrepresentation and misinterpretation. But it may be assuredly predicted that laws will be passed and policemen paid to make the very name of Behaviorism anathema.

WHY A RELIGION?

A certain audacity is involved in speaking of the new movement as a religion. An audacity which needs justifying. Not that I think I can maintain my right to the use of the word up to the hilt. But I believe I can make out a good case for it. And in the process I shall attempt to clarify the issues of a great intellectual fermentation, which is now furnishing and I am sure will continue to furnish a great deal of the genuine spiritual excitements of the twentieth century. As a matter of fact, it has already created enough disturbance to win for itself an important position in the history of the mind of the century.

Perfect definitions are possible only for the unreal. Definitions always mutilate realities. And hence all dictionaries are the hospitals of ruptured and crippled ideas. To take a single

word like religion and to try to transmit its meaning adequately by means of three or four, five or six other words, is to commit a crime. Let alone its essence and fragrance, let alone the emotional associations of any word, the meaning escapes verbal bounding in proportion to the observer's acuteness of perception. The more complex a reality is, the less completely can it be signalled to another by laryngeal or manual communication, by sounds or writing. If only one could point and say "That" about it!

One is forced then to resort to description, to painting, to music, to the piling up of information and detail to convey accurately a meaning. Only then can one have the other prerequisite for definition besides personal satisfaction—common agreement among those competent to agree.

A religion consists of a self-conscious attitude toward life. It consists of gestures toward the universe. It appeals to invisible powers, to intangible forces, to impalpable sources of inspirations and strengths. All of which are simply a homage to the Unknown. It is always mystic, even when most deliber-

ately rational, sometimes proudly, sometimes surreptitiously, sometimes dogmatically, sometimes with humility. The word God may or may not be an ingredient. A form of worship may or may not be implicit. The ultimate test of every religion is its effect upon conduct as well as feeling, its reactions upon behavior. And it always has a history.

Behaviorism fulfills all of these requirements for a religion.

In 1898 a young man—a very young man—named Edward Thorndike, submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy at Columbia University, a dissertation, entitled "Animal Intelligence." In this dissertation he reported almost the first experimental work done in the country upon the ability of animals like cats and dogs and chickens, to learn.

More particularly, he devised definite, controllable situations, such as puzzle boxes, into which an animal could be put, and its capacity for solving the puzzle studied. It was superb pioneer work, the type of pioneer work which creates a science. For with the publication of the dissertation was born the science of experimental animal psychology out of which came the whole behaviorist movement.

The trials and tribulations of the young man in carrying out his work deserve some noting. How, working at first at Harvard in his own room, and hatching his own chickens out of a gas-fed incubator, he was forced out by a landlady frightened of fire. How, for lack of room in the psychology department, William James permitted him to continue in the cellar of his private house. How the next year continuing under Cattell at Columbia, in spite of sundry difficulties, the classic work was completed. All these and the scores of other incidents will some day, I hope, form the enthralling material of the fascinating biography which is the due of the man who has been called one of the emperors of psychology. And it should be noted that though, in a sense, Edward Thorndike was the grandfather of the behaviorist movement, he himself never became a thoroughgoing behaviorist. Throughout his work you will find the word "feeling" respectfully mentioned. And the word "idea" referred to without scorn.

Undoubtedly inspired in part by the work of Edward Thorndike and the publication of "Animal Intelligence," was another young

man, a Westerner, named John B. Watson. He made certain inventions and investigations which were submitted three years later, in 1901, in partial fulfillment of the requirements for the degree of Doctor of Philosophy at the University of Chicago as a dissertation entitled "Animal Education." It was an experimental study of the education of the rat, or rather the educability of the rat, the way a rat learns to behave adequately in certain puzzle situations following the methods of Thorndike and another investigator, Small, who developed an important piece of apparatus for research in animal psychology: the maze.

In 1903, shortly after the publication of "Animal Education," there died and was cremated in England an old man named Samuel Butler who had spent a good part of his life combating the very ideas which these young men were now enriching with a fresh vitality and fascination because of their experimental work. The author of *Erewhon* and *Erewhon Revisited,* it is probable, heard nothing of either Animal Intelligence and Thorndike, or Animal Education and Watson. Otherwise, we may be sure, in spite of the pernicious

anemia from which he was suffering, for which there was then no adequate treatment as there is now in the form of a high protein, low fat diet, he would have uttered a blast against the intellectual poisoning of the mind of mankind which he struggled to anticipate and abort, but in vain.

Deriving from the two publications of Thorndike and Watson, the science of experimental animal psychology as contrasted with the science of experimental human psychology waxed, rushed through its adolescence and became an adult discipline in the psychological laboratories. It developed a precise, quantitative technique. It enlisted numbers of new investigators, some like Robert Yerkes with minds as keen and original as the founding fathers. It created for its own needs new journals, such as the *Journal of Animal Behavior*. It began to call itself "Behaviorism."

The idol and model of the introspective psychologists, the psychologists who studied their own minds by introspective methods, was Wilhelm Wundt, and the German psychological laboratories founded in imitation of the first psychological laboratory in the world created by him at Leipzig. At first these German laboratories of psychology were dedicated to the simpler possibilities of the experimental method, in studying the mental processes of human beings. Then an attempt was made to apply a combination of the experimental and introspective methods to the study of the higher thought processes, so called. There resulted a flood of literature, of pages and pages of writing in the most technical German, purporting to report the process in the mind of an observer as he thought a thought. The thought might be one expressible in a sentence of ten words. But the

protocols of the introspective adventures of the mind observing itself as it thought the thought, before, during and after consumed thousands of words. And the outcome often begot in the reader boredom and a sense of utter futility.

To the younger American psychologists, fatigued and discouraged by introspective verbosity concerning the thought processes, Behaviorism came as a godsend. One might say that the psychologists were affected at the psychological moment. Behaviorism, as the doctrine that the measurable factors in human psychology were the movements, the motions, of the body occupying time and space or the changes occurring in the muscles and glands of people, had a powerful appeal. Not the least powerful element in that appeal was the implication that the science of psychology, concerned only with the measurable as are all other sciences, should limit itself to these movements and changes and should outlaw altogether the introspective study of the mind, in fact, should outlaw the word "mind" altogether. Combining this attitude with that of ruthless critical analysis of all

propositions presented as the achieved in psychology and a certain stern regard for accuracy—and a strict elimination of errors of method and an establishment of standards—it is no wonder the behaviorists began to look upon themselves as the most scientific workers in the whole field of biology.

Not only were they going to create the one and only new scientific psychology. They were to become the pacemakers for contemporary workers in zoology and physiology. The latter had made many valuable discoveries. But they had made them carelessly and as it were inadvertently. Not so the behaviorists.

Now while the human being is the subject par excellence of human psychology, he cannot be that of behaviorism. For it is not feasible to carry out many behavioristic experiments upon human beings. There are all sorts of limitations. When the emphasis is put upon objective experiments objectively carried out, the human being is very poor material. To be sure, there is the laboratory of human experimental psychology, established in all universities for a generation or more. There experiments on the effect of the emotions on breathing and blood pressure, on the mechanics of illusions or even the process of learning can be carried out. But, the behaviorists asked with a scornful lilt in their tones, "What is the sum total of its achievement when it comes to a consideration of the principles of psychology?" Nothing but what

common observation and common sense have already more or less discovered.

Hence, instead of the human animal, another animal had to be substituted. Curiously enough, that animal has turned out to be the standard white or albino rat. That rodent, with the soft, yielding body that can be grasped in one hand, has been appointed by the fates (inscrutably but ineluctably dedicated to the advance of mankind) as the instrument of the restless human mind to penetrate once for all time the profound secrets of the human heart. Only, no behaviorist would ever dream of daring to put the matter in that naïvely anthropomorphic way.

Animals have played a great part in the development of the human race. They have served as the source of food and vestment. They have been gods and evil spirits. They have been faithful friends, boon companions, relentless enemies, indefatigable parasites. To man as an exploring carnivor they provided the material for his first lessons in anatomy, and to him as a curious breeder, his first intimations of physiology. But, unless we except the great generalizations of Animism, never,

until the twentieth century, did the audacious moment arrive when an animal is set before us as the great exemplar for the elucidation of the true laws of human nature.

No one acquainted with the history of science, and with some conception of its limitations and possibilities, can deny the tremendous service rendered mankind by animal experimentation in the laboratory. Without animals in the laboratory we should be mentally as the blind and the lame, and the deaf and the halt. We should be spiritually crippled beyond compare, and condemned to grope for knowledge with faltering footsteps.

All hail then to the white rat. For it is as if it were specially created for the purposes of the experimental laboratory. It is not too small, nor yet too large, so that thousands can be easily handled and housed. Its life span covers a period of two to three years, so that thirty of its generations, comparable to the span of a human millennium, can be observed in one man's lifetime. It is hardy and prolific, which guarantees adaptation to the confining conditions of the laboratory. It can be tamed and domesticated, can be educated, infected,

immunized, operated, mated, malnourished, studied in a hundred thousand different ways. In short it has become the priceless appanage of the biologist, be he student of heredity, of embryology, student of nutrition, of infectious disease, or cancer. The bacteriologist and the student of vitamins, apparently as far apart as Paris and Hollywood, have both become his eternal debtors. And now, the last of the procession to see in him the great opportunity, come the psychologists who would use him to illuminate the darkest crannies of the human soul.

For that he is supremely available. There are procurable races of him pedigreed for generations, that have thrived for generations upon the most standard of optimally nutritious diets, and they have been made chemically so similar that one may predict the chemical composition of the bones, the muscles and the viscera, may indeed within limits obtain him of a desired chemical composition. For statistical purposes, therefore, where one is perpetually haunted by vagaries of variability and the probable error, the white rat is the ideal.

Not that the animal psychologist has limited himself to the white rat. Every available animal, from the ameba to the cockroach, and from the earthworm to the gorilla, have been grist for his mill. But it is upon the white rat that the really respectable work, the genuinely irreproachable researches have been carried out. Or at least so he prides himself, with a certain measure of justification.

THE POSITIVE ACHIEVEMENTS OF BEHAVIORISM

Now what has Behaviorism accomplished? What does it now stand for, what is its strength, what is its weakness and what are its hopes and fears for the future? And remember that I write not as the voice of authority, nor as a deliberately hostile critic, nor as a consciously sympathetic exponent. I write as one who has been forced, in the exigencies of medical practice dealing with human personalities, to come to grips with the doctrines of behaviorism both in the problems of human maladjustment and breakdown and in the human ideal of supreme perfection yielding to weakness of the body or maladies of the soul. Sooner or later, too, I believe, every conscientious physician, as every earnest educator, social worker, economist, sociologist, every attorney and judge, every artist and crafts-

man, every laborer for human welfare, every man or woman hurt or seeking to avoid being hurt, striving to understand intelligently themselves and their fellow creatures, must come to grips and to terms with its strange doctrines that possess a power and a fascination. A strength and allurement formidable beyond all past brutalisms because they are backed by the strictest scientific technique of research and expression.

In the first place, behaviorism has thrown a certain amount of new light upon the learning process. The ability to learn has been defined as the criterion of intelligence. And in a certain sense, the learning process, the ways and hows of habit formation, how we learn to walk and talk, to hold up the head, to speak and read, and make the million and one adjustments of the day, may be said to be the central problem of psychology. The laboratory apparatus exploited by the behaviorists, the maze and the problem box, the discrimination box, and choice box, forms of apparatus in which an animal is set to learn a maze, the solution of a problem, such as

stepping on a trap door which opens the way to food, learning differences in perception (reception they call them) have contributed to lay bare the stark elements of the learning process.

WHO CAN LEARN?

It has been shown that a rat can learn, a worm can learn, ameba can learn, even a plant can learn. Learning, viewed as new movements becoming fixed in the repertoire of an organism, may be defined as a change in the behavior of an organism caused by a change in its environment, which change in behavior recurs whenever the causative change appears again in its environment. Since learning is so universally distributed, the behaviorists propose the abolition of the word "intelligence" and the word "memory." In their place they would substitute the word "modifiability." When you have learned, you have become modified. Which is in itself quite true. Intelligence consequently becomes "modifiability," and memory becomes the "modified." An organism or a personality is what it is largely because it has become what it has become. The process of becoming, or

the process of changing, is the process of learning.

No organism can ever be the same consecutively for two seconds. It must change and change inevitably. But the amount of change and the direction of change vary from organism to organism. The amount and direction of change and modifiability possible in a worm is infinitesimally small as compared with the amount and direction of change and modifiability possible to the human being. The difference in modifiability or intelligence between a worm and a human being is inherently dependent upon difference in the chemical composition and reactions of their respective protoplasms. The history of an organism or of a personality is the history of its modifications. Its biography consists of its adventures in learning and of how it has become thereby changed and yet more adapted to its environment.

Again, to explain the learning process, the behaviorists have exploited what is called the conditioned or associated reflex or reaction. Most people nowadays have heard or read about it. A dog's mouth will water when he

is shown some food after being kept hungry for a while, if a bell is rung at the same time or a little before for a sufficient number of trials, the dog will salivate whenever the bell is rung. That is, the sound of the bell has become for the dog what the food originally was. The reaction to the food alone is known as the natural, congenital, unlearned, prepotent reflex. As the reaction to the sound of the bell becomes associated it has become known as the associated, conditioned, substituted reflex or reaction. As any learning process, after elimination of errors, may be analyzed from the behaviorist standpoint, into a series of substitute reactions, the mystery of the conditioned reflex contains the heart of the mystery of personality.

Now, at this point, the behaviorist admits he can go no further. To him learning is living. And as the physiologist and the biochemist will ultimately in coöperation solve the problem of living and life and the nature of living matter or protoplasm, they will then, and only then, solve simultaneously the problem of learning. That it must at bottom be a physical and chemical process may be ad-

mitted. Learning, after all the pretensions of the behaviorists, continues to remain upon their own premises the Great Unknown in all the factors which determine the Personal Equation.

BEHAVIORISM AND THE GLANDS OF INTERNAL SECRETION

Recently, the behaviorists have preoccupied themselves with the dynamics of activity. An organism or a personality reacts and learns because it moves and when it moves, that is, when it is active. What makes it active? Or, at any rate, what makes it more active at certain times and on certain occasions?

According to the older psychologists, and particularly according to MacDougall of Harvard, it is all due to "instinct." Now the word "instinct" is a word in psychology that like a great many members of its vocabulary has been taken over from common everyday speech and assumptions. Rarely have common everyday language and conceptions introduced into a science ever survived ruthless criticism. The behaviorists, confronted with a word and a conception that challenged their

whole fundamental viewpoint, charged full tilt at the formidable champion of traditional psychology. Their lances dislodged a creature who turned out to be a man of straw. With a hue and cry they pursued his followers. And to-day there is no hypothesis in psychology so disreputable and tattered as the instinct conception.

In the place of instinct the behaviorists would put what they have found of the conditions determining activity. By pieces of laboratory apparatus known as the activity cage and the activity box, they have obtained records that show a certain rhythm of activity in an organism which occurs simultaneously with the contractions of the stomach and intestines. And in the female an extra phase of activity has been demonstrated which is concurrent with the period of "heat" or "œstrus," corresponding to the menstrual period of woman. This extra phase has been proven to be due to the liberation into the blood of a chemical, the internal secretion of the ovary. The ovary besides being an organ of reproduction is also a gland of internal secretion. It has been shown that castration and the re-

moval of other glands of internal secretion will cause a definite and marked drop in the amount of activity even though the animal apparently recovers completely from the operation and seems to enjoy ordinary health. Accordingly, lately, there has been introduced in place of the conception of instinct, the conception of the "drive," that is, the conception of a driving force operating in the organism as a result of some local physical or chemical change. So it has become fashionable to speak of a "hunger drive," a "sex drive," a "fear drive," etc.

Different animals have been compared as regards the nature of the different drives running them as machines. Thus the hunger drive and its effect upon spontaneous activity have been compared in the white rat and the guinea pig. The experimental data provide some interesting differences and contrasts. While the white rat shows periods of activity alternating with periods of inactivity due to a sleeping phase, the guinea pig does not exhibit any periods of sleeping. It is the interesting explanation of this interesting difference that the mode of recovery from

fatigue of the guinea pig is not to sleep but to feed. So that a rat when thoroughly fatigued, as well as starved, will sleep rather than eat. The guinea pig when starved, as well as thoroughly fatigued, will drag itself to the food, feed and recover quickly from the fatigue. This tendency of the guinea pig is probably connected with the superior size of its adrenal glands which, as is well known, provide an internal secretion which has an anti-fatigue effect. Otherwise, the data as regards the two animals show similar variations in their activity curves.

One must distinguish between the male and female in describing the data of spontaneous activity. The male and female both show phases or rhythms of activity (increased activity). These phases have been studied by means of the activity cage and the revolving cage. The data obtained all show that there is increased activity with increase of hunger contractions of the stomach, the peak of the activity coinciding in general with the phase of greatest gastric contractions, the so-called hunger contractions.

The effect of food upon spontaneous ac-

tivity has been shown to vary with the age of the animal. In young animals the ingestion of food is followed almost immediately by a phase of increased activity. In the older animals there is a phase of inactivity, the curve being something like a mountain flanked by two valleys. In the oldest animals, there is only a period of inactivity. The effect of temperature has been studied in relation to the effect of food. If the animals are exposed to a low temperature, there is a phase of inactivity following almost immediately the ingestion of food in the younger animals and a prolongation of the phase of inactivity in the period following food ingestion among the older. Activity is greater in the first twelve hours of the twenty-four in younger animals but tends to become more and more normal as the animal grows older.

In the female, the occurrence of œstrus or the period of "heat" adds a second physiological variation in addition to the hunger periods. There is in the female a cycle of activity which parallels the cycle of œstrus. If the animal is impregnated or the cervix is stimulated with a glass rod to produce the vaginal plug, œstrus ceases, and consequently the œstral activity closes. Young prepubescent rats, old rats and rats from which the ovaries have been removed do not show this phase of spontaneous activity which proves that it is dependent upon the internal secretion of the ovaries. Ovarian grafts into males will produce the female type of activity.

The analysis of the data of activity has resulted in the creation of the concept of "drive" as against the idea of "instinct." Indeed relentless attacks upon the precise content of

the "instinct" idea and the attempt to correlate it with the facts about activity obtained in laboratory and field studies have extracted all the old meaning out of the word.

IS IT POSSIBLE TO CORRELATE "INSTINCT" WITH ANY SPECIAL FORM OF ACTIVITY?

The kind of activity which is essentially *locomotion*, as contrasted with more specific activities, such as *handling* or *vocalizing*, is more or less *non-specialized*. In this sense it is diffuse and not directed to any goal. It contrasts with *instinct* in that instinct is apparently *directive*, and therefore, perhaps, may be spoken of as *specialized*. The position now taken by behaviorists is that instinct is really a learned organization of the animal's spontaneous activity. As regards "drives," this is another name for the forces operating within the organism to produce or generate the spontaneous activities. By forces are meant the energy producing mechanisms such as the hunger or sexual mechanisms.

These mechanisms operate both by way of the nervous system, releasing muscle reflexes, or by way of chemicals, internal secretions or

glandular effects. These may combine in various ways. Thus muscle reflexes may stimulate the secretion of adrenalin which may in turn set in operation other reflexes.

Finally, analysis of the data of activity has also resulted in the making of an important distinction as regards the position of the material substances or dynamic energies operating upon the organism. When they are placed outside the *organism* they are known as *Incentive*. When they are placed inside the organism they are known as *Motive*. In either case the material-dynamic complex must be relevant to the *Persisting Organism Process*. That is, the material-dynamic complex must be relevant to the process of the greatest magnitude and direction operating within the organism, which may perhaps be spoken of as the Dominant Drive. Subordinate drives, incentives and motives exist.

The various methods used to measure these facts consist of various methods of interposing *time*, *space*, and *energy* as obstacles to be overcome. Time is measured as speed. Space is measured by the elimination of errors. The energy of the organism removes or assimilates

the forms of interposing energy. The Problem Box, the Multiple Choice Box, the Maze, the Drive Box, are all methods used to measure the effects of the driver upon the time, space or energy obstacles to be overcome.

All to the good. Now observe what happens when we reach the questions of conscious feeling, conscious behavior of any kind. For the behaviorist there is no conscious because, according to him, "there is no evidence for 'mental existences' or 'mental processes' of any kind." (Watson.) Since the conscious is not directly observable, since, that is, it is not smellable, touchable, seeable, audible, tastable, it is not real. Ergo the conscious which is not visible as movement (but which, some will obstinately contend, manages to manifest itself in movements) is not real. At any rate it is not of the reality which should be noticed by true science. It should be placed, in fact, beneath the contempt of Science written with a capital S.

What happens, then, when one thinks he is conscious? Why, one is just talking to oneself. A train of stimuli have released a series

of tiny but registrable movements of the larynx, of the small, delicate and infinitely responsive muscles of the voice box. In other words, thinking, which is the essence of the conscious, consists simply and yet complexly of a network of sensations arising out of learned movements of the muscles and viscera and especially of the voice producing mechanisms, which goes on inaudibly. When you are at all conscious, if you are at all conscious, you are really just talking to yourself, really just whispering to yourself in the lowest of possible whispers. Thinking is really just silent talking. In short it is resolvable into certain movements of certain muscles.

How then does the behaviorist know that he is a behaviorist? How, in fact, does he get around the mystery of awareness, of, as he would call it, the mystery of reception? Call the mystery what you will—sensation, feeling, awareness, or reception, it remains a mystery. And that mystery is the core of the conscious. That mystery is at present impenetrable. That it is not measurable, that it is not directly observable is no more of an argument against it than the parallel questions concerning the existence and nature of electro-magnetism which might have been raised by a devoutly religious fanatic of the thirteenth century. Indirectly, the conscious is observable and measurable, like many other phenomena and forces whose existence and properties are inferred from their effects.

In his attitude toward the conscious, the Watsonian shows himself superstitious because

he wilfully blinds himself to the facts and the logic which contradict his viewpoint, and fanatically bigoted because of the unwarrantedly destructive zeal of his enthusiasms. Much good experimental work has been done. But beyond the iconoclastic hygiene of his searching analysis of opposing viewpoints one comes upon a land of barren theory in which purpose is hokum: feeling is verbalized sentimentalism, elaborated visceral reaction; and imagination, inspiration, creation, nothing but the swiftly evolved patterns of something like a rat running in an infinitely complicated maze.

THE IMPORTANCE OF CONSCIOUS BEHAVIOR

The nature of the conscious, its causes and its effects, seems to me to be a perfectly respectable, perfectly legitimate, researchable scientific problem. That it represents an effect of some kind, produced by the metabolism of the brain cells even the behaviorists might agree. As such, why, out of the countless effects presenting themselves to the human mind as problems for investigation should it be neglected, ignored or omitted from consideration? As for the possibility of its analysis by scientific methods, where in the universe is there an example of an effect resulting from the interaction of substances and energies not partaking of their nature? Whether the conscious can act or necessarily acts as a cause for events in the nervous system subsequent to its appearance is another question that remains to be studied and solved by scientific methods. Which raises the ques-

tion: Is the conscious a necessary step in the sequence of events which intervene between a stimulus and a movement in the behavior of a personality? Or is it a mere by-product, a noise made by the engines of the organism as it travels along the rails of habit? Or as Huxley put it, the epiphenomenon of an automaton? That the latter view is not at all tenable seems amply demonstrated to the present writer by a number of converging lines of evidence.

In the first place conscious behavior always appears whenever the organism must act as a whole to dominate a new situation either inside or outside itself. In other words, conscious behavior is correlated with non-habitual or novel behavior. As behavior becomes more and more habitual, more and more automatic, the conscious phase disappears. If the latter is simply due to the rattling of the machinery, why should there be a gradual withdrawal of the rattle, as the machinery begins to run smoothly? In all other machines, the rattle disappears suddenly with the appearance of lubrication or the removal of the cause. Why, besides, should the rattle have

so keen a conviction of its being so consequential in the removal of itself by its activities?

To put it another way, if the workings of "the mind" are not "the mind," what is? In practice we are all accustomed to make the distinction between the conscious and the "unconscious." When an anesthetist has controlled the movements of a patient by means of ether or chloroform, he is wont to inform the operating surgeon, "Now he is conscious," or "Now he is not conscious." When a baby who has not seen its father for a long time shows signs of familiarity we say, "Now he recognizes father." We say, "Now I see or he sees—Now I remember or he remembers—or, now I will or he will." We all use or tend to use the same criteria to infer the presence or absence of special phases of conscious behavior. The workings of the mind are as subject to the rules of deductive evidence as are the workings of the interior of an automobile.

All this would seem perfectly simple, obvious and necessary to common sense. As is well known to all sophisticated minds, however, nothing to-day in psychology and phi-

losophy is more completely ostracized from all good thinking society than the doctrine of "interactionism"; that is, the view that the mind or the conscious part of conscious behavior can have anything to do with the behavior's causation is looked upon by all good Ph.D's with the same horror and contempt that one can provoke mentally in Fundamentalist D.D's by doubting the bodily resurrection of Jesus Christ.

And yet there has grown during the last thirty years all over the world a body of evidence that the "conscious" in conscious behavior and also in non-conscious behavior may exert a powerful and even decisive influence upon conduct in health and disease. That body of evidence may roughly be named the evidence of psycho-analysis (also known as psychanalysis) fathered by Sigmund Freud of Vienna. It has been shown beyond a particle of doubt that the return to consciousness of a forgotten motive, episode or emotion may determine the disappearance of a whole system of habits which have been most annoying or even dangerous for the personality. If consciousness is a mere, ineffectual noise, why

should the return of the "noise" prove so significant for the behavior of the organism as a whole? In these cases, the "rattle" is seen to be an integral, indissociable, essential part of the complete process. There is no getting away from that.

There is no getting away from the fact that the movements of the human organism are inextricably intertwined with the complex of feeling, awareness and purpose which we call consciousness. To ignore that complex, to limit oneself to the study of movement cannot be good scientific practice. For it is the essence of the scientific method to maintain a receptive attitude toward all phenomena, and all the factors and processes that may possibly influence its data. Even to the man who is a specialist in behavior or prejudiced in favor of an emphasis upon behavior because of its practical social consequences, the omission of conscious and unconscious can only be the play without Hamlet.

The conditions under which conscious behavior appears and disappears, the variations in those conditions and the control of those conditions cannot be thrown out of any

genuinely scientific court as incompetent, irrelevant or immaterial. As a matter of fact there is at hand a definite body of knowledge which bears upon those conditions. One need refer the inquirer only to the really enormous and detailed quantity of information available on the relation of the chemistry of the brain cells to the appearance and disappearance of consciousness.

THE GESTALT CRITICISM

Last but not least of the critics that are directing their batteries against the behaviorist dogmas are the findings of Köhler, Koffka and their followers which can be summarized in the word "Gestalt." The word "Gestalt" is the German for form or pattern. Köhler studying the behavior of apes observed that they reacted not only to stimuli but to the relations between stimuli or, more accurately speaking, the arrangement of stimuli into forms or patterns. Before him Wertheimer, another German psychologist, had pointed out the determining importance of the formal relationships of an environment in elementary perception, and therefore in even the crudest forms of behavior.

The "Gestalt" movement (spoken of by some as "configurationism," configuration being taken to be the best available although admittedly inadequate translation of the

word "Gestalt") may be looked upon as the German retort to American behaviorism. For behaviorism is essentially an American product. No tariff has as yet been legislated by Congress to protect the American as against the German product. To present a complete exposition of Gestaltism that would be generally understandable and yet scientifically acceptable is beyond the scope of the present essay. But to present the issue "Behaviorism *vs.* Gestaltism" is of the greatest importance for the proper evaluation of behaviorism as mental food.

As a criticism of the accepted laboratory methods of study and analysis of sensation and perception, particularly in the newly arisen laboratories of experimental psychology, the Gestalt movement originated. It harmonizes with the ideas of Henri Bergson regarding the poisoning influence of the intellect upon intuition and the views of various artists, especially painters, on "values" and their correlation in any work of art which imitates or supersedes so-called reality. It begins by saying that to take a human being or an animal and to place it in the unaccustomed, unnatu-

ral and disturbing atmosphere of the laboratory and laboratory instruments is to wrong the truth grossly. Especially this is taken to be true, too true, when the conclusions drawn are generalized as the normal, everyday, natural behavior of the organism.

That you see is direct flank attack, devastating fire upon Behaviorism. The cry of Gestaltism is Back to Nature, Back to Field Study, Back to Perceptions as they Present Themselves. And there you will find that the ideas of stimulus and reaction, those pets of behaviorism, are as unreal as phœnix and unicorn. For direct, unprejudicedly contemplative observation always shows that under natural conditions there is never a single stimulus, but rather a whole group of stimuli so arranged into a total situation of interdependent parts that to take any one away and to consider it wholly *apart* from its concomitants is to create a fairy-tale. And the same criticism applies to the so-called reactions and the study of reactions. The behavior of an organism faced by a situation is always multifaceted. It behaves with all of itself, that is, with all of its parts. Where it is not excited

appears inhibition and where it is not inhibited appears excitement. One is entitled then, one is forced therefore, to speak of a new total situation in the organism arising because it is responding to the total situation in the environment. To call that response simply a reaction, such as a movement or even a series of movements, is crassly unjust and bad science.

For with the Gestaltist arrives another insistence. The total dynamic situation in the environment has an individuality all its own. To dislocate any of the parts is to violate that individuality, equivalent in effect to murdering and dismembering it, or to cremation quite as violent. As these metaphors imply, it does at any rate put the logical laboratorian and the logical behaviorist in the position of talking about a single thing when he means many things, of discussing a stimulus when he means the inseparable constituent of a configuration. In short it puts him in the position of an exponent of the most confused and inaccurate kind of thinking.

Now note how in this insistence the Gestaltist was anticipated by the philosophy of Henri Bergson, which is perhaps the most recent great original contribution in the history of philosophy. In order to learn more clearly what is going on in a cell, say an ameba, the microscopist first kills it. For this end he may use alcohol which both kills and dehydrates protoplasm. Then in order to bring out details and structures not visible to the eye under ordinary conditions of refraction he may stain it. Often, all sorts of effects are produced in the protoplasm because of the various treatments to which it has been subjected. These by-effects, known as artifacts, are the bane of the microscopist's existence. They drive him to resort to a number of devices for checking and duplicating what he sees in his specimens. And even when he obtains constant effects, it may not be true at all

that these are present in the living cell. Such for example are the Nissl granules, present in preparations of normal nerve cells. Every one admits that they are not a part of the fresh living nerve cell. But their presence is taken to mean that the nerve cell was in a fairly good condition at the moment of death.

Bergson's case against intellectual analysis (which is also the case of the Gestaltists, except that the latter have applied laboratory methods to test their views) is that in the search for truth which is science we are all microscopists. We must all take the living stuff of the real coming to us as the directly and wholly given, the directly and wholly perceived and "pickle" it for purposes of observation and analysis. And thereby so change and distort it, so fragment and mutilate it that the multitude of ensuing artifacts sets us wondering about one thousand and one pseudo-problems. The intellect, the brain, is an instrument of many limitations. And the most important of them to remember is that the biologic function of the mind is not to know, but to control. And whatever the hand seeks to control it must crush a little.

So much for Bergson and Gestaltism as anticipated by a contemporary philosopher. Now for some of the implications of the idea for the artist, the painter, the sculptor, the designer, the story teller. Here we may note how Gestaltism explains certain of their contradictions of the fundamental laws of logic as formulated by Bertrand Russell. According to Bertrand Russell, these are the laws of logic. The first law of logic is that A is A. The second law is that A is never Not-A. The third law is that A must be either A or not A. In other words, a thing is itself, nothing but itself, and either itself or not itself.

But the painter, for instance, has always known that these so-called laws of logic are false when it comes to a correct or natural rendition of reality. Whether A is A, whether A is not Not-A, whether A is either A or not A, all depends upon the context, content,

the milieu, the atmosphere, the surroundings of A. Suppose that grouped around A are B, C, D, E, and F. Now suppose that in place of E is substituted G. At once every artist knows that A is changed. It is no longer A, it becomes Not-A, and it may be at successive moments of time either A or not A.

That is the essence of Gestaltism. All reality as perceived presents itself to us as parts of an arrangement, a grouping, a design, a configuration, a pattern, a composition, a structure which has properties and qualities that are characteristic and therefore constitute its *meaning*. Also its parts have characteristics and properties which are essentially determined by the fact that they are parts. Moreover, intelligent behavior, when studied objectively, is always seen, whenever possible, to survey the "parts" of a situation, to "take in" their meaning as it were, and to respond to them as a whole.

SUPERFICIALITIES OF THE CONDITIONED REFLEX

How devastatingly all this can be brought to bear upon that darling of behaviorism, the conditioned or substituted reflex or reaction becomes apparent in an observation like the following of Köhler's. Chimpanzees, hens and a three-year-old child were trained or conditioned to react to one of two grays, one lighter, the other darker. Thus the chimpanzee might be trained to run to one of two gray pails, the darker contained food (bananas), the lighter nothing. These two grays may be designated as A, lighter gray, B, darker gray. If now a third pail is taken which is of an even darker gray than B, and which we may call C, and the animal is offered a choice between B and C, it tends strongly to choose C, that is, to run to the darker of the two pails. Experiments of this nature knock the behaviorist conception of a conditioned or sub-

tituted reflex as the unit of complex or learned activity into a cocked hat. For according to behaviorism, this conditioned reflex is a matter of specific cues, of a definite stimulus. Accordingly, the behavior should have become conditioned and stayed conditioned to the gray B. Instead the observation that the behavior is a reaction to relations, to meanings, makes the behaviorist concept of conditioning an obstruction rather than an aid to the prediction and control of behavior.

Again it becomes patent that the idea of the conditioned reflex or reaction was the outcome of a thoroughly superficial and scientifically unjust method of emphasizing data favorable and ignoring data unfavorable to a religious method of dealing with the problems of behavior. Neither a single stimulus nor a single sensation ever occurs in nature, nor can it really and readily be made to occur in the laboratory. Even if you could put a human being into a vacuum and flash a light on him, the light would emerge from a background of vacuity. And meanwhile it would be necessary to neglect the organic changes of attitude, readiness, fatigue and interest in him. Indeed

it is impossible to get a statement of the typically behaviorist S-R (S-stimulus, R-reaction) kind. Without the interposition of O, the organism-observer (himself organized and organizing) and the realization that behavior consists of S-O-R patterns or formations which are undergoing a process of transformation according to definite laws involving variables in S, O, and R, and applying equally in physics, chemistry and psychology, the S-R concept, the idea of special connections between stimulus and reaction becomes scientifically pernicious. How utterly unhelpful it is, may be illustrated by a discussion of the now famous phi experiment of Wertheimer.

THE PHI PHENOMENON

If in a darkened room an intermittently projected beam of light is permitted to play on a screen, one sees an area of brightness appearing and disappearing at regular intervals. If now a second beam of similar light is flashed near the first, one sees under proper conditions of timing and spacing of the flashes, not *two* spots of light coming and going, one after the other, but a *single* flashing moving back and forth on the dark background. The addition of the second flashlight has completely changed the perception and therefore the reaction involving the first. The stimuli have not produced two separate experiences, two separate spots of light each linked with a separate reaction as one would expect on behaviorist principles. The experience is that of a whole, an indivisible whole, with a meaning as a whole. To attempt to state the

psychology of the process in terms of physical individuality of the two distinct stimuli is manifestly to commit an absurdity. Which is precisely what behaviorism would have to attempt to do.

KÖHLER'S CONFIGURATING APES

Another experiment of Köhler's. An ape is permitted to try again and again to reach a dangling banana with either of two bamboo sticks. Then he found that with teeth and nails he could make one stick fit into the other. Having succeeded, he rushed immediately to where the banana was suspended and knocked it down with the double stick. All through the experiment the ape behaved as if he knew just what he needed to control the whole situation, possessing insight into the elements of the situation, *as a whole with a meaning.*

No behaviorist explanation of the ape's behavior as resolvable into a series of linked cues, linked originally by chance, can be satisfying. Nor can it compete with the view of the Gestalt theory, that we are dealing with a reaction of adequate configurations, a dynamic conformation partly contributed by the organism and partly by the environment.

In fact not the simplest case of perception is understandable or explicable on behaviorist principles. No perception is ever monotonous: that is, no perception is ever composed of a single entity. Always there are at least two parts: figure and background. Even when under the most artificial laboratory conditions when the eye is filled by one color, there are at least two component parts to a perception—the figure and the background. The color has a contour, however irregular and poorly defined. Which in turn emerges from a something even less well defined. But always a segment that protrudes, protrudes in relation to a segment that recedes. In other words, in everyday perception the perceived is like a painting in that it presents figures or forms emerging from a background or behind a foreground. And these figures or forms, with their backgrounds or foregrounds compose harmonic wholes.

The artist alone, for the psychologist, truly renders reality. It is true that he selects. But when he selects he never ignores the laws of perception. He selects as the mind selects: by growing one configuration out of another.

But always he remembers that he is rendering a whole of interdependent parts, an interlocking manifold. The interdependent or interlocking quality of a perception may be spoken of as its *organicity*. Perpetually the reaction of an organism or a personality is conditioned by or rather conforms to, configurates with the organicity of the stimulating situation. That is the fundamental law of all human as of all animal behavior.

And so once again the behaviorist conception of a single prepotent stimulus to which the organism with each and every part of itself, somehow reacts, receives a smashing blow. As Köhler has so well said: Behaviorism gives us a simple science with only a few concepts: but a good deal of the world of behavior and its problems do not occur in this science.

Leaving perception, consider another, so-called higher mental function, namely that of remembering, which is most important in conscious learning and consequently in conscious, intelligent behavior. There is a classic technique in the psychological laboratories for the study of memory. It involves the learning to perfection of a series of nonsense syllables, according to the behaviorists, as a distinct muscular activity (of the organs of speech) in which one nonsense syllable acts as a cue for the next. That indeed is also the old associationism over again.

Incontrovertibly, it has been demonstrated that the conception of associationism or conditioning in the explanation of the learning of nonsense syllables is utterly untenable. Connections between nonsense syllables consist of formations that function as more or less au-

tonomous larger units. The nonsense syllables grouped themselves into configurations which were either strongly remembered as a whole or weakly remembered as a whole. It has been proven that remembering and forgetting are influenced by the laws of all grouped syllable formation and alteration. To attempt to rely upon individual items results in an interference with the remembering of the whole.

All this is quite contrary to what one would expect upon orthodox behaviorist principles. For according to their reasoning, to stress individual items of what is being learned or remembered should strengthen rather than interfere with the process. It follows from these laws of configuration in learning and remembering that the most efficient way to teach the spelling of a word like cat to a child is not to teach that c-a-t is cat but as a unit—cat, the three letters connected as much as possible rather than separated. As a matter of fact it has been shown quite conclusively that children learn much more readily by the latter method than by the method of learning individual items or stimuli.

The configurative nature of a form of behavior entitled to the name of instinct is suggested by another observation of Köhler's. It and others indeed seem to rehabilitate the idea of instinct which the behaviorists claim they have made obsolete. Again and again, he reports, he has seen an ape, about to consume a green leaf partly deposited in the mouth, suddenly remove the leaf from the mouth as if compelled by some irresistible force, place it on the ground, collect other leaves, and build a nest with them. There is no better example extant of the power of the nest building instinct.

And also no better example is available of the patterned character of so-called conditioned behavior. For all the logic of behaviorist explanations cannot predict the type of behavior thus effected. All the logic of behaviorist explanations is in fact completely

contradicted. For the eating habit is established long before, and is continued for years before the appearance of nest building activity. Yet the configurative force of nest building completely changes the reaction to the leaf. If an old habit can be so thoroughly modified by a newly learned activity, then good-by to all the genuine possibilities of control in the vaunted predictive power of the behaviorist laws of behavior.

On the other hand, if we look upon behavior as activity in which the organism or personality configurates with the environment, contributing its quota to the stimulating conditions so that the whole forms a harmonic composition according to definite principles, the superiority of nest-building configurations may be consistently understood. Or as Köhler has put it: "Reorganization of the field (of stimulation) by subjective stress seems to be an important side of intelligent behavior."

The tremendous power of configurative stress within the organism or personality may be compared with the inevitable sequences of a symphony. One concordance irresistibly suggests another that equilibrates the move-

ment and yet permits continuation. The artist, in music as in painting, exhibits insight into the character of conscious behavior when he creates dynamic configurations which arouse similar configurations in others.

BEHAVIORISM'S SERVICE TO SCIENCE

Behaviorism performed a great, an incalculably valuable service for psychology by the annihilation for all time of the anecdotal school in its field. The method of generalizing about the behavior of animals and human beings by the narration of anecdotes is banished forever because of its work. How necessary that critical performance was, may be gathered from the tenor of the following anecdotes I have selected from a book called *Mind in the Lower Animals in Health and Disease*, published in 1880 by W. Laud Lindsay, M.D., F.R.S.E., F.L.S. and honorary member of the New Zealand Institute. In the preface he states "I have studied the subject of mind in other animals as compared with that of man, for a series of years, simply as a physician-naturalist" and then "I profess to deal only with the facts of observation and with the scientific or logical inferences that

may be based upon or drawn from such facts.

"I have omitted, therefore, every topic, however interesting in itself, that does not admit of scientific demonstration or legitimate argument or inference—in other words, all that belongs to the region of speculation." And he ends his preface with the couplet:

"Tis not the hasty product of a day
But the well-ripened fruit of wise delay."

That the book is a serious and well-considered attempt to survey the field of mind in animals may be gathered from the chapter headings of the first part which is called Comparative Psychology, General Considerations Including the Methods of Inquiry.

These chapter headings show how scientifically earnest and thorough the author wished to be:

1. Results of Human Ignorance, Error and Prejudice
2. Faults and Fancies of Terminology
3. Authenticity of Anecdotes of Animal Sagacity
4. Study by Observation and Experiment

5. The Dawn of Mind in Man: Mental conditions of children and savages
6. Evolution of Mind in the Ascending Zoölogical Scale:—The Vertebrata
7. Evolution of Mind in the Ascending Zoölogical Scale:—The Invertebrata
8. Animal Reputation
9. Alleged Psychical Differences between Man and Other Animals
10. Alleged Intellectual and Moral Supremacy of Man
11. Interrelations of Instinct and Reason
12. Unsolved Problems in the Psychology of the Lower Animals.

Then follows a section entitled Mind in the Lower Animals in its Normal Manifestations, with a subsection entitled Morality and Religion, with the following chapter headings:

1. The Moral Sense in Man
2. The Moral Sense in Other Animals
3. Moral Merit and Demerit
4. Moral Responsibility
5. Religious Feeling in Lower man
6. Religious Feeling in Other Animals.

From this section the following gems may be culled:

"Church attendance by dogs is, and has long been, a common phenomenon in the pastoral districts of Scotland. Scotch shepherds, both in Highlands and Lowlands, are a devout, church-attending race—and, so far at least as concerns regularity of attendance upon the ordinances of worship, and demure, decorous behavior thereat, their dogs, or 'collies,' are equally devout. These Scotch collies frequently have particular seats or pews—or at least their equivalents, lairs, or couching-places—in church, and there when no attempt is made by them—as it sometimes is—at psalm singing, the animals rest quietly and sedately until the completion of the service. It may be, and probably is, the case that they frequently coil themselves comfortably and compose themselves to sleep as soon as the service has begun; but that a similar process is quite as common and much more conspicuous and inexcusable in man, I have no room for doubting, in as much as I have over and over again myself seen in country—aye, and in city-churches in Scotland, people—

mostly males, be it in fairness explained—deliberately composing themselves for a good, sound sleep before the service begins—a sleep so natural in one sense as to be not unfrequently accompanied by snoring and to require vigorous nudging or shaking to rouse from it.

"We may be—and no doubt will be—told that the shepherd's dog acquires the habit of attending church and of behaving becomingly therein, by mere imitation of its master. And there can be no denying the important influence of imitation in the acquisition of artificial habits by the dog and other animals. But many incidents, or classes of incidents, show that in this case of church attendance at least, the influence of man or mere imitation is apt to be overrated—is, in fact, really much less than at first sight it appears to be—for church-going dogs do not by any means always or necessarily attend church with their masters. They sometimes go in spite of, and without, their master, feeling that they are incurring his displeasure and a certain punishment in doing so. Knowing, by means which we must not stop here to consider, Sunday from other

days of the week, and the proper hours of public worship on Sunday; quite familiar with the road to church and with the topography of the church itself; quite aware, further, that it is their master's wish or intention to prevent their going to church on Sundays —many astute dogs, determined, for their own reasons, to have their own way, have disappeared on Saturdays, have secreted themselves in order to escape imprisonment in a kennel or elsewhere, and have made or found their way to and from church quite alone. Southey tells the story of a Methodist's dog 'who regularly went to chapel, though pelted by the church boys for so doing. His master . . . never went'; and the interpretation put upon the dog's conduct was that he wished to attract his master to church attendance. It is at least a coincidence that when his master met with an accidental death by drowning, the animal ceased to attend chapel. Dr. Macaulay too speaks of many church-going collies as 'more regular attendants than their masters.'

"It is obvious that, in many cases at least, such dogs value church attendance as a priv-

ilege, for which they are prepared to make, and do make, great sacrifices. Not only do they travel long distances afoot in all weathers, but they deprive themselves of shelter and food, and expose themselves to their masters' wrath, and to the certainty rather than the risk of ignominious punishments."

"Scotch shepherds' collies are not, however, the only dogs that have been popularly, and with a certain degree of propriety, denominated 'religious.' In France, a Catholic country, dogs attend prayers or mass with their masters, exhibiting in the grand cathedrals of that beautiful land a becoming demeanor, silence and motionlessness, an attitude of apparent attention or intentness, and a probable feeling of awe, produced, it may be, by the 'dim religious light' of such edifices, or by the varied, impressive sights and sounds that environ them—a kind of conduct, in short, only too instructive or suggestive to irreverent man (Pierquin). It would appear further that in Catholic countries imitation of man leads church-going dogs to the stage of fasting (Southey)."

It is such anecdotes and such conclusions,

proffered as science, that behaviorism rescued us from at the beginning of the century. The achievement will be held eternally to its credit. Its revolt from anecdotal as well as introspective verbiage was the healthiest species of refusal to endure the intolerable. There was a great need of overhauling of the machinery of methods and data in psychology. In the process, however, the spark plugs were catapulted with the carbon. The science would have been left in a curiously crippled and distorted state if the doctrine of Gestalt had not appeared upon the scene.

While behaviorism was celebrating its *triumphus* between the years 1913 and 1917 and erecting monuments inscribed Rest in Peace over the conceptions of awareness and feeling and purpose as important in the natural history of the behavior of man and the lower animals, Wolfgang Köhler was quietly conducting his studies of the intelligence of man's kinspirits, the apes, in a manner that must needs win approval from the most severe behaviorist as far as technique was concerned. Off the coast of Africa, on the little island of Tenneriffe, one of the Canary Islands, the Prussian

Academy of Sciences had long maintained a Station for the Study of the Anthropoid Apes. There, when not playing tennis or the piano, Köhler devised the most ingenious experiments to which nine different apes were at various times submitted. In effect the technique of these experimental studies of their behavior was comparable to the methods worked out to test the intelligence of children by Binet and Simon, and their successors, the now well-known intelligence tests. And that was what Köhler regarded his researches: as intelligence testing of the apes. It became obvious that the simple behaviorist principles of stimulus and reaction, conditioning and substitution could never adequately incorporate or explain the observations made. Most significantly of all they showed that intelligence consists of "insight" as well as "modifiability," and "insight" involves consciousness which in turn involves awareness, feeling, and purpose as well as the ability to configurate by means of ideas. *An animal performs by rote, it never learns by rote.* And during learning the entry of consciousness into the configurative pattern is prominent, and fur-

ther, more or less determinant of its variability. In the learning curves of Köhler's apes as well as those of others a precipitious drop occurs, a sudden fall in the number of errors made and time consumed with the resolution of the problem by "insight."

INTROSPECTION REDIVIVUS

The return of consciousness as an important factor in the scientific problem of understanding behavior means the return of the introspective method as a necessary psychological procedure instead of the position of pariah shunned and despised, to which the Watsonians would assign it. It is a disciplined introspective method, however, an introspective method which has itself been studied introspectively and extrospectively with the aid of the Gestalt critique. In consequence, the function and effect of introspective observation in psychology has been established. The configurations constituting and stimulating the sophisticated consciousness of the trained professional or even amateur psychological observer are by no means the same as those effecting and modifying the naive mind, say that of a baby or a child. Alterations of the configurative pattern undoubtedly have taken place

during the different phases of development including infancy and childhood, adolescence and adulthood. But as these alterations follow laws that are studiable and predictable, like the law of simplifications of the configurative pattern according to which the perceived attains with duration, a greater and greater precision and definition of outline and design, the more naive and primary configurations may be inferred. It is an introspective method duly aware of its own limitations, and properly chastened as to its claims. Yet it remains central in all the Gestaltists' experimental studies of perception, learning and thinking.

Consciousness becomes once again a respectable citizen of the scientific universe. As legitimate subject matter for psychology, and particularly for human experimental psychology, there follows a resurrection of the subjective into the communicable and verifiable data of the most precise measurements and controlled variation of conditions constituting real knowledge of the "workings of the mind." That means the exiling for good of all attempts to describe and explain intelligent

behavior as chance substitutions and fixations of meaningless movements. Vicious abstractionism, as William James called it, in the study of human character and conduct is sentenced to lifelong imprisonment on the island of the obsolescent.

Nevertheless the reëmphasis upon the presence of consciousness in "insight," and "configuration," should not be taken or rather need not be taken to provide an opportunity for the revival of ancient metaphysical, theological, mystical or spiritualistic distinctions between the body and the mind, the organism and the soul.

As Koffka has put it " . . . these authors separate body and mind. They conceive personality as a purely mental, spiritual fact, cutting Natural and Spiritual Man sharply asunder. This distinction is of course not valid for us. For us, personality, too, is a natural phenomenon, and we do not think we are detracting in the slightest degree from its worth by assigning it its place in Nature, which rightly viewed is not a stupid, meaningless heap of whirling atoms but a universe of evolving and decaying configurations." Or

as Herrick has said: "The evidence is biologically adequate that mind (awareness) as we know it phenomenally is a function of a particular configuration of bodily organs."

The Gestaltists stand between the proponents of blind mechanism like the Watsonians on the one hand and the defendants of the dualism of body and mind on the other. Köhler in fact has constructed a series of postulates concerning configurative phenomena in nature which embrace physics, chemistry, biology and psychology in a single system. In his book *Physische Gestalten* (Physical Structures), which deserves to be translated as one of the most brilliant contributions to science, he has developed the theme that nature, the subject matter of physics and chemistry, never contains isolated units but consists only of interpenetrating configurations. The environment stimulating the organism therefore represents a physical configuration generating a psychical configuration. And in general a correspondence can be shown between the physical configuration and the psychic configuration. When such a correspondence is not obviously

present, a relation between the two sets of configurations involved can be demonstrated, the relation being determined by the established laws according to which configurations in general are altered. The order of events then is that a physical or chemical configuration produces a physiological which is reflected in a psychic configuration in the organism. It follows that instinct, habit and intelligence represent not three different categories of behavior, but aspects of the same underlying configurative activity. Samuel Butler struggled to assert that doctrine in a series of books beginning with *Life and Habit* and ending with *Unconscious Memory*.

ELECTRICAL CONFIGURATIONS

Modern science conceives the atom as an electrical configuration of one degree of complexity. The molecules of matter are regarded as a more complex configuration of atoms. In the last analysis, the properties of matter are believed to be dependent upon the ways in which the atoms are combined in the molecules. Higher and larger units exist which are higher and larger configurations. Living organisms, including Man, are the most complex of these larger units or configurations. Ultimately all such units should be statable as electrical configurations. The reactions between an organism or a personality and its environment are, therefore, from the most fundamental viewpoint, reactions between different kinds of electrical configurations or systems.

DERIVATIONS OF THE PSYCHOPHYSICAL LAW

This conception has enabled Köhler to deduce the famous psychophysical law of Weber which asserts that when a present stimulus is perceived as just different from a past stimulus of like nature, the value of the past stimulus has been increased or decreased by an amount which represents a constant fraction or percentage of it. For instance, if a weight is perceived as weighing twenty-five pounds, then the weight which will be perceived as just heavier may be twenty-six pounds. One pound, one twenty-fifth of the first weight had to be added before a difference in weight can be perceived. If now a weight is perceived as fifty pounds, again one twenty-fifth or two pounds would have to be added, making a weight of fifty-two pounds, which would first be perceived as different. Between twenty-five and twenty-six or fifty and fifty-

two the weights would be perceived as about the same. The law holds true between certain limits.

The law was originally discovered empirically by Weber over a hundred years ago. No one has hitherto been able to understand or explain its working. That it can be developed as a consequent of the fundamental ideas of Gestaltism strengthens enormously the scientific validity of the latter. For whenever a conception can be used to predict mathematically an empirically discovered fact or law, the whole theory is fortified all along the line. Einstein's achievements in prediction of the directly measurable in physics and astronomy on the basis of his general principles have been responsible for the great amount of attention they have received.

These considerations are important because they cut the ground from under the behaviorists' manifesto that their general attitude and method is the only one that conforms to the accepted technique of physics and chemistry which are the exemplars of good scientific method. It is one of the chief tenets of Watsonianity that the behaviorist viewpoint alone

is susceptible of assimilation by the other sciences, alone capable of engendering fruitful quantitative researches, and alone therefore worthy of the name of a truly scientific psychology. It is one of the outstanding dogmas which lays the whole movement open to the charge of religious intolerance. The performances of Gestaltism, both in theory and in practice, are entirely adequate refutations of that particular contention.

THE FUNCTION OF MEANING

Meaning, its place in life as well as in the dictionary, its function in perception as well as in conduct, is the other formidable issue dividing the two groups of psychology. Where the behaviorist asks: What is this animal or human being doing? and declares that an all sufficient question to ask, in fact the only question to ask, the Gestaltist insists that one should also and always ask: What does this animal or human being mean to do? No real and comprehensive understanding of behavior except as a series of muscle twitchings, is ever possible unless one looks behind or beyond the behavior to its meaning for the animal or human being. Meaning is the watchword of the Gestaltist as behavior is the war cry of the behaviorist. Whenever the latter justifies himself and his ways with the principle that he is concerned with that practical matter—behavior, the former al-

ways retorts that the most fundamental problem, to which all others are secondary and subsidiary, is that of meaning—significance—implications. Meaningism might be the synonym of Gestaltism.

Meaning is defined in the dictionaries as object or aim. The definition complies in its essentials with the demands of Gestalt psychology. Since its major reiteration is that the intelligent behavior of a human being or animal can never be comprehended except in terms of striving toward some goal. Which, by the way, is the essence of the psychopathologic doctrines of Alfred Adler, once disciple of Sigmund Freud, who bases his explanation of the Inferiority Complex upon difficulties encountered in the functioning of the Will-towards-a-goal.

To the behaviorist meaning means nothing except when it means potential behavior, the promptings of the immediate or remote cues. To the configurationist meaning means the completion or clôture of configuration which involves a reaction pattern. It is resident in the properties and proportions of the configuration as a whole and is not deducible or

predictable from the properties of the parts.

Draw a short line upon a sheet of paper. Now draw a square using this line as one of the sides. The line is physically the same in both experiments. Yet its meaning in the second experiment is quite distinct from that in the first. In the first it is the distance between two points, in the second it is the boundary of a figure. Place four black dots on white paper in the form of a square. Actually the dots are four black hieroglyphics on a white background. Yet they irresistibly suggest a square, or configurate as a square, as the Gestaltist would say. Now remove one of the dots: at once the meaning is altered from squareness to triangularity. The finding of significant shapes in clouds is another good example of the configurative activity of the mind. A hungry baby will cry, will kick his feet, will roll his eyes, will suck his thumb. To the mother these movements or acts mean "hunger" and configurate with giving of food and taking of food.

In all of these cases, the organism or personality reacts to configurate because of the inherent relations of the configurations, phys-

ical or psychical. The perception of meaning which is the most important factor in the intelligent behavior of human beings and animals, is a perception of the necessities and harmonies of configurative patterns. Meaning is abolished when a configuration is artificially fragmented into parts which are then supposed to become connected somehow, no one knows how, the favorite Watsonian pursuit.

To mean means to configurate as a *whole*. In all intelligent, that is, meaningful activity, the configuration is seen to be dominant. In studying his apes, Köhler found the following interesting facts that bear out this conclusion. In an experiment, bananas were placed too high to be reached by a single box. But if two or three boxes were piled one upon the other, it could be reached. The animals quickly learned to do this. If, however, a necessary box was fitted snugly into a corner of the cage, it was not used. If it was moved a little out of the corner it would be used. Evidently, in the corner, the box and the cage appeared as one configuration, as part and parcel of the same thing. In one experiment it was necessary for the apes to use a beam to get what they wanted. If a rope is wound around the beam, it completely spoils their perception of the beam as a beam. They pull,

scratch, bite and tug but never attempt to unwind the rope, reacting to the rope-beam as a whole because it means for them a whole. If it is necessary to use a board in attaining their goal, and a box of boards is at hand, they will tear off a board only if there is a space intervening between one board and the rest of the box. Otherwise the boards constituting the box are taken to constitute a whole, and no attempt is made to separate them. In another experiment, it was noted that one ape who needed a box in order to reach some suspended fruit made no effort to drive off an ape who was reclining on a box that would have been useful. Once the ape arose to go elsewhere the box was at once seized and employed as a support to knock down the banana. In each experiment, it is apparent, a different significance was attached to each object depending upon its configuration with other objects. Meaning and consequently behavior, therefore, may vary with the transfer of a stimulus from one configuration to another. The phenomenon is beyond explanation by behaviorist principles of cue linked with response.

CONFIGURATING WITH THE UNIVERSE

Let us now view another consequence of the attempt to convince people that there is no consciousness in them, nor any unconscious.

Consider the following case. A surgeon about forty-five years old, successful in every sense of the word, married happily and with two healthy children, takes a trip around the world as a vacation. On the trip he does a good deal of reading and thinking, reading and thinking which he has neglected for years. When he returns home, he breaks the news to his wife that he has decided to retire from practice, that he has in fact determined to engage in no activity. To her astounded questions, he replies that he has become convinced of the utter futility of his work and indeed of all living. In fact he has become doubtful of the good accomplished by his professional career, and rather certain of a definite

amount of evil. In the discussion that followed, he recalled the case of a woman whose life he had saved in an attack of appendicitis who had ten years later developed cancer which plagued her for three years and then killed her. Another case that of a boy upon whose head he had operated to remove a blood clot, after an accident in a football game, who five years afterward became completely paralyzed, was now enduring a living death. Another case, a woman whom he had brought to life again after an operation during childbirth, and who was now a raving maniac suffering from paranoid dementia precox, in a sanatorium. A hundred fundamental questions, ignored and submerged, now were almost an obsession. Most obsessive of all was the question: What does it all mean? What does it stand for? What is it all about? To repeat that these questions were specious—old, and the theme of philosophers and thinkers from the beginning of recorded thought, was no consolation, provided no relief. They recurred with a violent insistence upon their urgency. After some months of discussion, he reported one day that he had concluded

that the only logical solution was to seek Nirvana by self-destruction. Only as he knew that he would cause infinite pain to his wife and children by the act, he would postpone this act as long as he possibly could.

Now began a round of consultations. First, the trusted familiar, confidential physician was given the opportunity of a physical examination which revealed nothing. The diagnostic specialist was permitted a series of special tests and examinations which were also negative in their outcome. As a result, the patient was donated the valuable advice "to forget it," to take up literature or iron-work or some other hobby, and above all to return to work. The admonition failing, a neurologist was consulted. He found nothing wrong with the nervous system organically, but the symptoms were reminiscent of a syndrome sometimes called "folie de doute"—the insanity of doubt. There were a number of elements in the present case which made it quite different—but still it was suggestive. Hence, departure for a psychiatrist who was also a mental hygienist and psycho-analyst, who was beloved by all with whom he came

in contact, and who had had a great deal of experience with neurotics. He decided that there was no "folie de doute," but a psychneurosis in need of psycho-analysis. Followed a year of tri-weekly conversations which involved much muck-raking of dreams and the repiecing of biography. At the end they were just where they were at the beginning. The patient more convinced than ever of the ruthless cruelty and the senseless frustration of the life from which he could escape by the simple act of a minute.

At this juncture the name of a consulting psychologist, well-known for his thorough advocacy and application of the principles of behaviorism, is supplied the wife. Much persuasion on her part finally induces her husband to consult him. Now how would a behaviorist deal with the problem, the problem of furnishing a meaning of life, a set of meanings which would enable such an individual to carry on. What could he do? The supply of life energy was intact. That had been settled by the previous examiners. He might begin to speak of conditionings, to look for responsible conditioning. But as the psycho-

analyist had already determined that there were no significant "complexes" (which are nothing but unverbalized conditionings on the basis of his own principles) there would not be much to find.

To the clear-minded behaviorist, to whom the universe as a whole, like other wholes, means nothing apart from its parts, the problem would be insoluble. To him the universe is a collection, a summation, an enumeration of stimuli, which have no meaning except in so far as they are responsible for reflexes or conditionings. Ultimately therefore the world consists of a host, a series, of fragments, interpretable and reactable as just so many items representing potential behavior. To a man or woman who would get sick of just behaving, who asks: Why should I continue to go on behaving? and for what am I behaving? no answer except that of "You must because it is your nature," is available to the honest behaviorist. Which, of course, is simply begging the question. It seems to me that all he could do would be to advise the man to go ahead and try suicide.

The Gestalt theory, I believe, provides an

answer. With its emphasis upon meaning and the significance of the whole, it would at least bring a more hopeful attitude and method to the problem. The means may not yet be completely at hand to solve it for the soul in hell we have been considering. But as larger and larger units, more and more complex configurations are seen to take on more and more meaning in the light of Gestaltist formulations, the Universe itself, that largest unit and whole of all, must itself be considered the greatest Gestalt the mind of man can bear. The best advice the consulting Gestaltist could offer to my imagined patient might be: *To configurate with the universe.* To configurate with that everlastingly tremendous harmonic composition, transposable in so many keys and instruments, with its unresolvable discords and clashing movements, is at least suggestible as the method by which a man so troubled by questions which the behaviorist cannot even recognize, much less understand, may find salvation. For in the light of Gestalt man and the universe, man and his environment, are inherently one, parts of a whole, the properties of which are dependent upon the

fact that they are parts. So are they interdependent for their very existence.

Man and the universe, therefore, cannot, should not be put over against one another, as hostile entities. Rather they can and should be viewed as figures and background of a titanic drama. That at least is a more livable-with, yet subtle and scientifically valid alternative to seeing ourselves as jack-in-the-box automata, the marionettes of reflexes, which behaviorism offers us as a religion with all the crudities and vacuities of the most hopeless as well as the most bigoted of all religions.

To include all the information at hand a book might be devoted to the religious signs and symptoms of our times. In America there has been no dearth of investigations, warnings, jeremiads concerning the falling interest in religion. If the rate of church attendance is a measure of sensitivity to the old convictions there is no lack of evidence of a degeneration. There can be no doubt that the old established, recognized religions are losing their holding power over multitudes. So completely that no adaptation of modern methods of publicity and the big drum, no subtle modifications of creed to fit the Zeitgeist can revive faded allegiances. Nor can revivalist campaigns of hysteria turn back the multiplying infidels.

It is no longer now a matter of rejuvenation of the old conflict between science and religion. In that conflict of the biologists as

David, and the intrenched plutocrats of the sects as Goliath, victory was long ago decided. All one can now note with a certain interest concerning subsequent developments is the peculiar ability of the human mind to function in water-tight compartments, compartments in which one set of ideas is never permitted to mingle with another. Hence the spectacle of the eminent physicist attending the Baptist Church on Sunday, the celebrated chemist a shining presence at chapel, the well known zoölogist unashamed to be visible at the worship of the myths in his ethnos. Not that the edifying spectacle is seen as a universal phenomenon. How many of our scientists are pious churchgoers I have no figures to present. But I should hesitate to have to defend the claim that they form more than a disproportionately small fraction.

Yet there can be no denial that the human soul cannot endure without a religion. Impossible it is for it to persist without a dynamic cement to bind together its conflicting desires and clashing instincts and to sustain it against desperation and damnation. The mind and life of modern man is complex be-

yond the dreams of paleolithian naïveté or Greco-Roman sophistication. More than ever he needs vital beliefs by which to live as a whole personality rather than simply as an occasionally rational animal driven by habits, impulses, compulsions internal and external.

Without a religion there can, indeed, be no release from the biological imperatives. These biological imperatives are the urgencies of the immediate, the pressures of the present, the irresistible drives of the organs of which we are constructed.

Behaviorism provides no escape from these tensions, no counterpoise to their unbalancing excitements.

Man cannot live by his organs alone. As a dynamic entity, he lives in a universe, with the universe, against the universe. He lives among other fellow creatures, with other fellow creatures, against other fellow creatures. He lives in his own soul, in an atmosphere of self-critique and self-appraisal. Inevitably he is torn and wasted in a maelstrom of forces when he is not directed by a set of feelings and ideas which permit him to step outside the universe as it were, and to inspect it with

a detached absorption. Or to remove himself, if only temporarily, from the sphere of his fellow creatures and to see them grouped in the relationships of which he is a part. Or himself to become disembodied, to look upon himself from without and again as a whole. All that, which is comprised in the meaning of salvation, a good working religion should be able to provide.

SUICIDE AS A SYMPTOM

Recently there occurred an outbreak of suicide among student youths. At once the phenomenon fastened the attention of the sects upon the importance of advertising their conceptions of what makes life worth while.

Within a few months a number of students have taken their lives, leaving behind them letters stating their sense of the futility of keeping alive. The record runs: On January 2nd, a University of Illinois student killed himself, writing that he had experienced all that life contained. On January 3rd, a student in a Brooklyn Evening High School hung himself, leaving a note for his parents in which he said he was depressed and worried from overstudy. The same day the son of a specialist in mental disorders, shot himself in his father's home. He found life "dark and worthless" he wrote his father. On January 23rd a student in the University of Wisconsin

shot himself because he was bored with this earth and wished to see how things were over there. There has been a continued series of such suicides subsequently.

Another is described in the New York *Morning World* of February 23rd, 1927 (the names have been omitted).

"A twenty-three-year-old student of music and philosophy and a graduate of De Witt Clinton High School, destroyed both himself and the books which had absorbed him early yesterday at some unascertained hour.

The fifteenth student suicide within nine weeks lived with his parents in Coney Island.

'He had the mind of a genius,' said his mother in tears yesterday. 'He was a master on the violin.'

Unlike his brother, who was a football star at New York University two years ago, he was not bent on outdoor sports. He inclined to reading and spent all his spare time that way while in high school, the time, that is, when he was not working on his violin. He became moody and introspective.

'Only a few days ago,' said his father, a painter and decorator, 'he gave up his job on the steamer *Seminole,* running from New York to Florida. He played the violin in the orchestra there. He had traveled extensively and he felt he knew the world.'

The parents said that Monday night he took them both to the Hippodrome. When they went home the father and mother went to bed and they last saw him bent over his books in the lamplight at 2 A.M.

His library, gathered by himself, included more than a hundred volumes, among them Schopenhauer, Nietzsche, Freud, Darwin, Spencer, and Huxley and numerous other books on philosophy and psychology.

'He had become agnostic,' said his family. 'He believed there was nothing in either life or death. He said he never feared death. Whenever anybody expressed fear of death he would remonstrate. We were afraid he might do something rash.'

Some time after 2 A.M. he gathered together his books and carried them to the basement. He brought there the volumes of notes he had written, comments on philosophy and

the like, and then stuffed everything into the firebox. He returned to the kitchen, stuffed the cracks of doors and windows with paper, and then, lying down on the floor in his best clothes, turned on the five jets of the gas range.

About 8 A.M. the father rose, and, smelling gas, hurried to the kitchen. He called the police of the Coney Island Precinct and an ambulance was summoned, but the young violinist was dead of asphyxiation."

An editorial in *The Nation* of March 9th, 1927 (which appeared a few days before that date):

"Suicide waves, like crime waves, are largely products of newspaper psychology. Year after year twelve or thirteen thousand people in these United States take their own lives, and most of them die unnoticed. The adolescent years contribute their full share. But let the son of a prominent man kill himself, and dozens of suicides which would otherwise have gone unnoted become front-page news. The fact that nearly a score of

college students killed themselves in January and February does not constitute a 'wave' to the students of statistics. Individuals follow individual impulses; in the mass the movement is much the same. It is safe to say, to-day, that in 1927 about 8,500 men and 4,500 women will commit suicide in the United States; that Los Angeles will have the highest suicide rate of any city in this country; that there will be a few suicides of children under ten and more of veterans over ninety; that the young will, in general, prefer poison, the middle-aged shooting, the old hanging as a means of self-destruction; that more men will hang or shoot and more women drown or poison themselves; that Saxony will have the highest suicide rate in Europe, and Ireland the lowest. Year after year these figures repeat themselves, paying no heed to the waves of interest reflected in the newspaper headlines. The ratios here to-day will not be very different from those discovered in Europe forty-eight years ago when Thomas Masaryk, now president of the Czecho-Slovak Republic, published a famous study of suicide. Man does not change suddenly; although habits and

customs do alter through the generations and across the surface of the earth. Napoleon attempted suicide, and Hannibal was honored for his self-destruction; for Dido self-immolation was an almost religious rite, as harakiri still is in Japan."

And on March 8th, 1927, as if in answer to this editorial in *The Nation,* The New York *Sun* reported:

"A twenty-year-old student at Princeton University killed himself to-day in a dormitory in Hamilton Hall there, drinking iodine and hanging himself to a light fixture in his room. His body was found some time later by a janitor. He left no note to explain his action."

This adds one more to the long list of student suicides. On it already there have been inscribed the names of more than a score of young men and women throughout the country—ranging from high school students to men in graduate schools—who have grown weary of life. In many instances too liberal

interpretations of the philosophy of the pessimists have been blamed; in others the cause remains mysterious.

He was an honor student at Princeton, which already had had a student suicide to report, in each of his three terms there. He had been in ill health since birth and during his time at the university had been continuously under the care of the director of physical education. His condition had not, however, been thought acute. . . .

He lived in Louisville, Ky. None of his friends at school could give reasons for his act. . . .

It was less than a month ago another student of Princeton killed himself. He was a student at the graduate college and one of the most mature of those who have been washed under in the wave of depression, which apparently has swept over many members of the student body of the nation. He inhaled gas in his apartment in Princeton, leaving a wife and a two-year-old daughter. He had felt that he was a failure, both in his personal relations and as a member of society.

The list of those who, while preparing for

life, have found its burdens greater than its rewards, includes both sexes and varying ages. Only a few weeks ago a high school student, 16 years old, killed himself near his home in Elizabeth, N. J. He took poison to bring about his death in the lobby of a church near his home.

In Hempstead, L. I., another high school boy—18 years old—shot himself on the stage of the school auditorium where a few days before he had taken the leading rôle in an amateur production of "Seven Keys to Baldpate." He could not find even one key to life.

Chicago has furnished several of the suicides. A fortnight ago a boy there shot himself with a rifle in the garage of his father's home. He left no explanation. In Iowa the youngest of the suicides, a boy of 12, killed himself about a month ago. Several girl students have taken their lives.

Among the others in the steadily growing list are the following: . . . the son of the poet, who hanged himself at Yale; another, who shot himself while on a vacation from the University of Rochester; . . . a friend

. . . and a student at the same school shot himself a few weeks later.

A student at the University of Chicago Medical School was one of the earliest to take his life in the present group. James Moore of the University of Illinois shot himself after overstudy. A student of the University of Wisconsin took his life and left a note saying that he wanted to discover what the future life was like . . . another student at the University of Chicago took his life only a few weeks ago.

Various reasons have been ascribed by the suicides for their acts. An Iowa boy wrote that "to die will be a glorious adventure." Others died because they could find no adventure anywhere. The name of Schopenhauer appears in many explanations—few of which, however, were given by those who died. Educators and clergymen have made speeches and written papers in explanation.

In most instances there has been an agreement that the number of student suicides is abnormally high. A few have contended that undue emphasis has been placed upon the number of youths who have ended their lives.

Several "anti-suicide clubs," intended to take some not very clear steps to curb the growing tendency have been formed among student bodies.

The New York *Morning World* of March 10th, 1927, published the following:

"A religious questionnaire at Princeton University, formulated by a senior student, and indicating in part that 145 students have lost their faith in a personal God since matriculating at Princeton, has been withheld from outside newspapers since March 2nd by the Princeton Press Club."

He circulated his questionnaire in February and sent the results to the campus newspaper, the *Daily Princetonian,* after the tabulation March 1st.

The *Princetonian's* front page report of the questionnaire said in part:

"On the average between 1,000 and 1,100 students responded to each question.

"On the question of a personal God, the

negatives outnumbered the affirmative by 557 to 504, while the same question as to belief prior to entrance into Princeton shows a preponderance of 657 ayes to 418 noes.

"Belief generally seems to have lost ground in proportion to the length of the college course, while more freshmen and sophomores were conscious of a belief in a personal God before coming to college than were juniors or seniors.

"Credence in a personal God was barely victorious by a score of 482 to 477, while personal immortality also won out, 520 to 476.

"There were 573 agnostics as against 525 whose faith prevailed over doubt. . . . The atheists were snowed under by a count of 963 to 101.

"A marked preference for tyranny over anarchy was indicated by a vote of 757 to 302, while 589 declared themselves more willing to be called militarists than pacifists, in contradistinction to 491 who held the opposite view.

"The value of a higher education in instilling a respect for culture was seemingly indi-

cated by the 853 over 261 who voted that culture was more to be valued than wealth. . . .

"Sixteen conversions to the theory of a personal God were apparent from the results, as against 145 who testified to the loss of faith. The totals in both cases were largely recruited from the upper classes.

"The 1,100 ballots returned represent half of the total enrollment of Princeton's 2,200 students.

"All Princeton news reaches the outside newspapers—in Philadelphia, New York and elsewhere—via the Princeton Press Club, a self-perpetrating body of twelve student members. One of its former Presidents was Alexander Leitch, who now as Director of Public Relations has an office in Nassau Hall adjacent to those of Dean Christian Gauss and President John Grier Hibben.

"A member of the Press Club informed the *World's* correspondent that Mr. Leitch had requested that nothing be sent out on the Garnett questionnaire. This, however, Mr. Leitch denies. The *Princetonian,* although a

campus institution and not having dealings with the outside world as has the Press Club, appears to be more free of censorship from Nassau Hall than the correspondents of the great daily newspapers.

"Singularly, when a sophomore hanged himself in Hamilton Hall on Monday, to all appearances because he had been turned down for membership by two Princeton clubs, Cloister Inn and Tower Club, no member of the Press Club sent out the actual story, and the *World* carried it exclusively in its report yesterday.

"When Dean Gauss and Mr. Leitch were asked by the *World's* correspondent about the 'suppression' of the religious questionnaire, they made light of the matter and maintained that nobody had taken the questionnaire seriously.

" 'We considered it,' said Dean Gauss, 'more as a "razz" than anything else.'

" 'Why,' said Mr. Leitch, 'you can judge of the questionnaire when I tell you that one of the questions was Which do you prefer, Anarchy or Tyranny?'

"Inquiry among the editors of the *Princetonian* disclosed that each individual had given serious answers to the questions, but thought that many others might have replied in a spirit of levity.

"Mr. Leitch last night denied that he had requested the Press Club to withhold the story, although he admitted that he might have exerted an influence in that direction.

" 'The questionnaire was circulated by irresponsible persons,' he said, 'and was considered more or less of a hoax.' The members of the Press Club themselves got together and decided that if the tabulations as printed in the Princetonian go to outside newspapers and press associations they would be misconstrued and misunderstood by the general public."

W. H. R. Rivers, who was a psychologist as well as an ethnologist, once studied the degeneration of the inhabitants of the Melanesian islands after the advent of the White Man. Particularly was he interested in the fact that in certain of the islands there was almost complete extinction of the native population in

spite of the presence of plenty of the materials of subsistence and the absence of epidemic or unusual disease. As a result of his study he came to the conclusion that these peoples were dying out because they were losing their zest in life. And they were losing their zest in life because the coming and cunning of the White Man had undermined their attitude to life so completely as to affect the very Will to Live. The White Man's Priests had killed their ancient gods. From the dead beliefs of the past they could no longer absorb any joy of living. And because of the very great gap between the Old and the New, they could not assimilate, they could not digest properly, the vast novel universe presented to them by the invaders.

It seems to me there is an analogy between the state of mind of these students and these native populations.

All kinds of reasons are being given for these suicides as exemplars of an underlying drift in contemporary life. A complete diagnosis in those particular cases is impossible. Murmurs are heard concerning mental

hygiene. Sermons are preached by priests, clergymen and rabbis, moralizing on the necessity of a return to the old rites and the life-saving power of the old customs. But the fact remains—modern science and its younger brother, modern life, have undermined the validity of the old myths and fairy tales. Out of harmony with that vast collection of information the critical methods of biology have provided concerning the origins and nature of man, no amount of revision and patching can make them an adequate living faith for the modern mind.

No wonder then that thousands, aware of the breakdown in institutionalized beliefs, have been converted to the implications for everyday living of the theory of natural selection. For that provides a more or less complete history of the universe. Also it provides a more or less complete picture of the history of Life on This Earth. In that picture Man stands a superanimal among the animals, endowed with their heritage, and controlled fundamentally by the law which controls the universe, the law of survival of the fittest.

Crude, inadequate, stupid as that conception may seem to the contemporary biologist, the general impression is current that its acceptance by the man of science is almost compulsory.

THE IRRELIGION CALLED BEHAVIORISM

"Are you a Behaviorist?" is a question that has been fired at me not at all as often as the assertion, "You are a Behaviorist, aren't you?" Because I have been impressed in medical practice with the determining influence of the glands of internal secretion upon personality traits (of which disease symptoms are simply instances) and because I have been convinced of their overwhelming importance in physiology, psychology and medicine, I devoted two books, one called "The Glands Regulating Personality" and the other "The Personal Equation" to the exposition of my views. In consequence, it has been unwarrantedly assumed that I am an out-and-out mechanist, in spite of the fact that I endeavored to forestall the possibility and wrote that "The declaration that a man is dominated by certain

glands within his body should not be taken to give aid and comfort to those who would banish mind from the universe."

We live in an Age of Anti-Feeling. The Smart Set has become the Smart Crowd, indeed, the Smart Mob. Nothing nowadays is considered more disreputable by the cerebral than depth of feeling. To seem sentimental means exposure to persiflage beyond redemption. Though even the meaning of the word has never been settled.

Continually on the scent for bunk, urbanites and suburbanites, wise because instructed by radio, tabloid, and press agent, pride themselves on being intellectually hard boiled when they are only somewhat parboiled. As for cultivation of the emotions, particularly the finer human emotions, as antitoxins for the poisons of the intellect—intellectual passion would have to become universal before the arrival of that Utopian day. Behold the spectacle then of our men and women of ideas accepting the charge of being cleverists, careerists, trivialists as a compliment, but shrinking with the horror of that most horrible of all horrors—the horror of ridicule—

from the stigma of being called sentimentalists, emotionists, feeling-ists.

Behaviorism then is sympathetic to the age. By extravagantly exalting movement, by placing "what a man is doing" so emphatically in the foreground, by regarding seriously the half-truth that language is a series of muscle twitchings, essentially in the same class as walking or running, and by reducing the emotions to "nothing but" visceral reactions—"something going on in the guts and the glands"—Behaviorism appeals to the worshipers of noise in contemporary arts and manners. While the scientists are supposed to have welcomed its materialism as completing the solid structure of the rest of science, the believers in direct action in politics hail its implications for them. In a time like ours when among proliferating cities, in every branch of human activity, motion and commotion are infinitely preferred to contemplation and insight, the gospel of muscular (and glandular) conduct as the conquering creed of the twentieth century may be expected to be hailed as the very indigenous credo of a democratic people.

The effects have been bad and will become worse. Worst of all has been the effect upon those scientists of the whole personality, the physicians, who should be diagnosticians of the soul in order to be therapists of the body. Contrast the impossibility of that on the behaviorist assumption that to understand a patient it is necessary only to put him through his paces—that is, to exhibit his interesting symptoms and signs as modes of behavior.

To be a true blue behaviorist in the treatment of the sick, obviously will be a mere logical "of course" to the physician who is coming more and more to rely upon the laboratory and so-called scientific methods of precision. Inevitably he will ignore altogether the ailing self, the self existing within the human test tube in which are going on the reactions of the disease.

When the delicate, finely balanced organs are deranged, the personality is disturbed in the most subtle ways. "All is not well with us"—the organs keep the wires hot with that message. Who can dare to neglect in diagnosis the intensely or only slightly impressionable temperament, the fastidious or gross, the

callous or easily intimidated personality! It emerges supreme after all, growing out of the coördinate collectivism of the organic structures. How much harm has been done, is being done, to his patient as well as to himself by the behaviorist-physician's absorption in the nature and history of the lesion, instead of the accompanying soul-malady as well, is patent as soon as the issue is stated.

The behaviorist, in fact, comes to us with a challenge to all our values, of good and evil, right and wrong. There is no aspect of human life he does not touch with his ubiquitous concepts and attitudes. Not only in the most personal confidential relationships of the practice of medicine enter the rigors of his method. In the law and in education also will he come, he is coming, with his defiant technique. As for psychiatry, and the social workers and the handlers of social problems in behavior, he is already triumphantly in the saddle, his language the accepted nomenclature of the experts and his theories the means by which the lives of children are being regulated and mutilated.

BEHAVIORISM AND FREEDOM

Most to be dreaded of all the injuries that may be inflicted by Behaviorism upon the souls of sensitive personalities (the others do not matter) is the effect upon their sense of freedom, their attitude of initiative, which means their feeling of being intensely and fully alive. The repetitive tom-tom of the Behaviorist drum is insistent that we are wholly and totally the victims of conditions beyond our control from the moment of birth to the moment of extinction. And of course the same applies to before-birth, the period which stretches between conception and parturition. In the womb the genes in the chromosomes commit their silent crimes upon the personality. And afterwards, without regard to any central theme of individuality, movement begets movement, habit begets habit, a chain of cause and effect forces the machine

now along that one way street, now along this.

Consider the value of yourself, of your life, of your strivings and efforts, of your sense of need of which you are so poignantly conscious, of the feeling of your unique self in the light of the conditioned reaction! How stimulating to indomitable courage, how invigorating to weakening morale, how inspiring for the discovery and invention of beauty in life! To see himself as the product of muscle twitchings and gland oozings is the most degrading spectacle of himself ever presented to Man. Far preferable are the mysteries of black magic, the sacrifices to Baal and Moloch, the fanatical rites to primeval demons. For they at least provided life with a dignity, an importance, a fascination. Incontestably one should choose rather to be surrounded by devils against whom one contends with a sense of the overwhelming significance of the personal victory than to be entangled in a net of reflexes to struggle against which is vain delusion.

In the language of its protagonists: of all the modes ever offered for the use of conscious behavior, Behaviorism has the least sur-

vival value. Call it humanism, pragmatism, instrumentalism or what have you. The fact remains. Information, ideas, theories about ourselves may, must, inevitably help or hinder us to live. The effect may be to exalt, intensify, inspire, transform consciousness and conduct. Or it may be to depress, infect, sicken, dishearten to the point of death. In that sense even the Behaviorist must recognize the existence of higher and lower values in the universe (although he strenuously denies it). And what he presents to us is among the lowest of all possible low values.

However, if Behaviorism is really the last word of science upon the subject of ourselves, it is possible that we stand revealed to ourselves, at last, as ourselves. That we shrink from the repulsive portrait, that we cry out in disgust against its implications, may be human, but not altogether justified. No! No! Of what avail is it to the sufferer from malignant disease to repeat No! when the hard, cold facts—the hard cold facts of science—murmur, Yes! Certainly! Without any doubt!

GESTALT AND FREEDOM

One of the most heartening consequences of the Gestalt point of view is the restoration of intellectual integrity to the conception of human freedom. The refrain of behaviorism has always been: stimulus and reaction, stimulus and reaction, stimulus and reaction, stimulus and reaction. In the series of jerking muscles or spewing glands there can be no room for the human will. A stone rolling down a hill pursuing the most fantastic of zigzag courses we know is simply being pushed and pulled about by what it meets. All living beings including the human are merely being pushed and pulled about by encounters between chance and habit. That view would confer upon psychology the distinction of being the blue science of the twentieth century as economics was the gloomy one of the nineteenth.

From the standpoint of Gestalt it is possible

to develop a workable conception of human freedom. For it restores validity to the possibilities of choice and variability in human behavior. In fact, it makes possible the possible in life, not as a result of the impact of chance upon habits, but as the result of a participation of the organism, of the self, in the determination of the patterns it weaves as it behaves.

EMERGENT EVOLUTION, TWIN OF GESTALT

Coincidently with the Gestalt movement in contemporary psychology has grown a movement in contemporary biology becoming known as Emergent Evolution. Curiously enough, the blooming of Emergent Evolution means that the very ideas of evolution out of which Behaviorism has evolved are now becoming obsolete. And even more curiously, the doctrines of evolution which are now being promulgated are in the most thorough harmony possible with the conception of the Gestalt. As a matter of fact, Emergent Evolution might be described as the idea of the Gestalt applied to Evolution.

Evolution as a process in the universe, as *the* process of the universe, is denied nowadays by no competent mind. To-day, as always, the problem is—not to *admit* evolution, but to *explain* it, to *understand* it. If you will talk to the most logical and fervid of the Be-

haviorists—the Watsonians—you will find the claim that Behaviorism—Behaviorism alone—is consistent as regards the dominance of mechanical laws in the origin and development of species, species structure as well as species behavior. On that basis, only Behaviorism is entitled to consideration as a blood brother of the other biological sciences which have precisely the same viewpoint. Whereas the other attitudes in psychology have no more right to such a relationship than, say, spiritualism or palmistry.

According to these behaviorists who swank most about the identity of mechanism in biology and psychology, it is all very simple. Harking back to Lucretius, we have, to begin with, the atoms—or if you wish to be truly modern and up-to-date—the electrons and protons. According to certain fixed mathematical laws they move and combine. The unit of movement is the erg, which is the amount of energy consumed in lifting one gram of water through one centimeter in one second of time. As the units of matter combine or separate in different proportions, there are consumed or liberated various ergs of

energy. Thus the different structures are produced which are the species of biology as a series of successive appearances and disappearances—the more recent being a regrouping of the elements of the previously appearing. The process as a whole presents itself to us as the phenomenon of evolution.

To the limited human observer, it looks as though something new had come out of the old in the course of time. But that is pure anthropomorphic error. What is now was predestined at the beginning of things by the nature of things. Where we are now, on this speck of a planet, we can see changes proceeding according to the self-same laws and the self-same conditions which ruled a million or a trillion years ago. An omniscient scientist observing the appearance of a jelly-fish at the moment when a jelly-fish first occurred, might have predicted the World War. The World War was inherent in the nature of the jelly-fish and the conditions which produced it.

Moreover, as a matter of universal fact, all that is happening now as it happened then, represents a reduction of the supply of free

energy in the universe. There is no other meaning to the process. The time is coming when there will be no more free energy, when all energy will be at the same level throughout the universe. Then, indeed, things will cease to happen; even the *appearance* of new things will cease to be. The universe will be *dead* forever. If one only knew enough now, the exact date of that could be stated as a deduction of mechanics. Meanwhile, all the tragic history of mankind, all the pain and maddening horrific disease, all the overwhelming catastrophes, all the tremendous travail and fatigue, all the heroisms and crucial decisions, have been but superfluous interludes, passing ripples, in the great ocean which is drifting to the perfect calm. When the universe at last will have attained Nirvana. What price individuality then?

Over and over and over again, the essential sameness of the past, the present, the future is reiterated. Though ever so exquisitely conscious of alternatives in your life, the conviction is a delusion. What you are going to do, what you will do is predetermined. Conditional, conditioned predetermination has set-

tled what you will actually do. There never are, there never were, there never will be, real alternatives, real possibilities. All that hallucination of the efficacy of ideas, purposes, choices is due to defects of language and expression, linguistic fallacies. Because as a matter of science—established by careful, cautious, painful research—we are machines and all the performances, properties and possibilities of a machine can be calculated from a knowledge of the properties, possibilities and performances of the preëxisting parts. And again what seems to be "new" in behavior (the "new" which appeals to us in our feeling of "freedom," "initiative," "choice") is "old," "inherent," "latent" in the elements out of which the behavior has appeared. There is indeed nothing to be expected under the sun except that which was to be expected even before there was a sun.

According to the proponents of emergent evolution, these pronouncements of evolutionary behaviorism may be flatly contradicted. For they are all at bottom unproven assumptions, dogmatic presumptions. Genuine science, self-conscious science, science which

knows just what it is about, puts forward no such claims. While it may be true that evolution proceeds by the addition, subtraction, multiplication or division of parts or by their rearrangement, the important principle is involved (which may be noted as also characteristic of the Gestalt concept) that every such addition, subtraction, multiplication, division or rearrangement (or transformation) means a change that is radical throughout the organism. No one part of an organism can change without a change occurring in its other parts and their properties. Hence arises a law of a certain unpredictability, of novelty, of genuine transmutation of the past into the present by which the present comes to possess a complete, unique individuality of its own. Which perhaps is its justification, its raison d'être.

A simple analogy may clarify the issue. Water, as is well known, consists of hydrogen and oxygen. Hydrogen is a gas, oxygen is a gas. Water, characteristically not a gas, characteristically a liquid, consisting of two parts of hydrogen and one part of oxygen, has none of the properties of either. It has characteris-

tics, special and unique properties of its own. The oxygen and hydrogen in the water possess properties they never possess except when they are combined in the relationship designated as water. For instance, the hydrogen is no longer inflammable, the oxygen can no longer be used for breathing. The chief lesson of chemistry is that the part is dependent upon the whole for its essential peculiarities and significances.

All along the line that principle holds good. As evolution has progressed, as electrons have conglomerated into atoms and atoms have configurated into molecules, as the non-living have conjoined to make the living, as solitary beasts have congregated into communities, the process of conjunction (or disjunction) has brought out new potentialities, fresh powers, inconceivable activities in beings which in a previous, simpler state of existence might have been exhaustively analyzed and mathematically stated (by behaviorists, for example)—without any one the wiser as to what they might be capable of in future, should they enter into hitherto undescribed, unimagined, incalculable combinations or permuta-

tions. In other words, you can never know *enough* about a thing in one situation to be able to predict *everything* about it in another situation.

Obvious and enormous are the consequences. Evolution then is seen to be the realization of unpredictable possibilities. It has been no perfectly mechanical unfolding of a complicated accordion played upon by a chance foredoomed by Predestination (otherwise known as Predetermination). That the transformations of the most interesting of Gestalts, living things, have been dependent upon the properties of their physical and chemical components is verified. But those properties were properties revealed in living things, revealed when they were parts of non-living things, never present when they were non-living, never present when they were parts of the non-living.

It makes a difference, a very great difference, whether the atoms are functioning in molecules or in living cells, a difference so great as to amount to the difference between a spear and a Shakespeare, between a ton and a Newton. The chemical elements are the

same everywhere. No peculiar chemical elements have been discovered in the living, characteristic and distinguishable from the chemical elements which occur in the non-living. It is all rather a matter of the arrangement of them, of their configuration, of the Gestalt by which the Different (in the sense of the unforeseeable) is generated.

Evolution means the emergence of qualities and modes in a higher state of existence that have been submerged in a lower. It means, as a most important corollary, that it is no longer compulsory to explain the higher in terms of the lower—the kind of explanation that would measure all values with its tiny measuring rod of "simply" something that is inferior and mechanical and rather contemptible. The pageant of species this earth has seen has represented the appearance of strange powers in the universe. Forms begot forms, but new attributes arose out of old attributes as an everlasting demonstration of the capacity of matter to vary infinitely. The emergence of latent capacities that become visible only after the labor of arrangement, signifies that to us as observers at any rate: the universe is

forever dedicated to eternal generation, unending parturition, inexhaustible individuation.

The play of environmental factors upon individuation must itself be subject to the laws of Gestalt. What may assist one organism here may hurt another organism there because of differing conditions of configuration. Species of animals and plants have evolved according to the self-same principle concerned in the mutations and survivals of good and bad psychological patterns. To survive, to perpetuate itself, organism and environment must form a good configuration, that is to say, a configuration which must endure; while bad configurations, configurations which cannot endure, of necessity must be wiped out, unless they change.

Whether this conception of evolution can meet all the requirements that may be demanded of it by all biologists remains to be seen. At any rate, the introduction of the Gestalt or Emergent viewpoint represents the banishing of the solely mechanical viewpoint in biology with its pretentious finalities. For that viewpoint is emphatic concerning the

"closed" character of our knowledge of structures and behaviors as soon as they are stated in terms of mechanics.

By pointing out how "open," how relative powers and functions are to situations, the configurative-emergent-attitude cuts the ground from under the behaviorist who would claim that he alone is being consistently an evolutionary biologist. It is just as possible to be a logical evolutionary biologist for one who recognizes the dominance of the Gestalt in all behavior, in physical systems as well as psychological.

Down, then, with the method of reduction to the level of machinery, the method of belittlement of all that is characteristic in the Alive, in the valuably Human! It is no longer necessary to worship the laws of Nature as merely the laws of the material and the bestial. Because atoms or perhaps worms or rats are wholly subject to the domination of their habits, it does not follow that Man or even the apes need be. Because masses of chemicals function in the living, physics and chemistry and mathematics must be brought in to illuminate their activity and to control them. But always remembering that we are to expect new physical, chemical, mathematical as well as other properties in the situations of the living cells.

According to Gestalt-emergent principles we may look in the living for all sorts of new

powers and capacities to occur. And we do find them to occur. Among them we observe conscious awareness, conscious thinking, conscious purposes, conscious ideals, conscious behavior, all of which we may summate under the name of mental properties. And among the most striking and the most cherishable is the feeling of freedom, and the ability to be free, conditionally.

Freedom may be defined as the degree of variability of the Gestalt, the capacity to vary of the Emergent. All physical structures, any chemical system, may change in certain directions. The simpler the system, the less the number of factors of elements that enter into its make-up, the less is the capacity to vary. It thus becomes possible to speak of the "degree of freedom" possessed by a physico-chemical system. You will find the term "degree of freedom" so used in textbooks of physical chemistry and thermodynamics. Pure liquid water, for instance, may be said to possess two degrees of freedom; it may become ice or it may become steam.

Now it is impossible merely to enumerate all the factors entering into the constitution

of a human being and so to state his degree of freedom, as a system. But let us take just one portion of him, the portion of him that is acknowledged to be dominant in determining his behavior, the brain. Suppose we assume that its degrees of freedom are a function of the number of possible connections between the nerve cells composing it, because it is these connections between nerve cells which constitute the life of the brain. The possible connections have been estimated as a number expressible by 10 followed by 59 noughts, millions of millions of millions of millions. There are therefore at least that number of degrees of freedom for the human brain. In relation to the twenty-four hours of the day, that number of degrees of freedom is equivalent to an infinite degree of freedom. No wonder man spontaneously tends to think of himself as free, since there is every reason for him to feel himself free.

We need therefore no longer fear that the future belongs to the Behaviorist. He may be founding a religion, but it will never be an intelligent religion. And no modern mind, sensitive to the prestige of the scientific

method, need bow in acquiescence, feel compelled to accept its acrid canons.

No one can pretend to finality about any of these conceptions, Behaviorism, Gestalt, Emergent Evolution. No one can pretend to finality about any live issue. I have sought to digest them for religious needs. To him who yearns for the admission that in a discussion of the more modern ideas about human personality and character, one should mutter the words "provisional," "subject to revision," "still limited to the cloistered sanctity of laboratory and library," permission is given to insert them wherever they may seem a comfort. The pragmatic method in religion and science as in medicine and art is the method of working to-day with whatever is available to-day. A mind in flux must make definite intellectual alignments. For a synthetic attitude finds that the universe exists for the adventurous initiative of that unique emergent: Man.

THE END

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